

its calculations, and Alice noticed it stopping at each corner to look at its clock, and then, shutting its eyes tight, and screwing up its face, it made rapid calculations on its fingers, scribbling down the results in its tiny pocket-book by the aid of its large pencil.

"May I ask what you are doing?" said Alice.

"Pacing," said the Beppie; "Can't stop."

And on it paced, taking enormous strides, and as Alice watched she saw it catch up the White Rabbit, and they hurried on together, and disappeared round the corner.

Alice began to feel very uncomfortable. Was she dreaming? or was she mad? or were the animals mad? or were they all mad?

(A JUNIOR.)

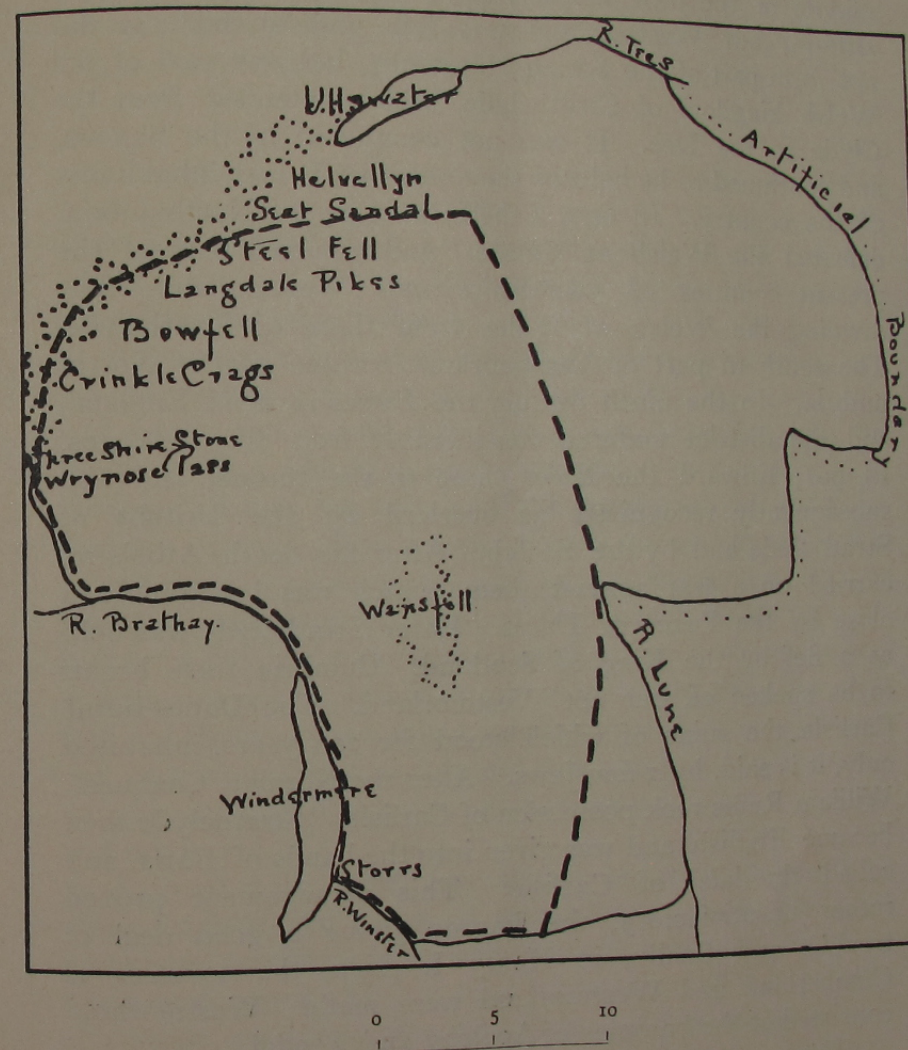
SCALE HOW,

11TH JULY, 1903.

Pacing is the means by which we measure distances. For instance, we pace from Scale How to Waterhead—perhaps it comes to 1500 paces. We know the length of our pace before we start; mine is about thirty inches. Then we reduce the number of paces to feet or yards, and so we have the distance. Also we "take directions" with a compass, to find whether we are walking towards N., S., E., or W. Some people do "time" (the Beppie in "Alice at Scale How"); that is, they count their paces for one minute, and then leave off counting but walk on steadily. Having reached their destination, they see how many minutes they have taken, and multiply them by the paces they counted. This is a very muddled explanation. It is most annoying to get to Waterhead and be accosted by a boatman—"Nice day for a row, miss!" "No," you splutter, "56, 57—no—58—thank you—60!"

In the sports the answer had to be in yards, so several people took enormous yard paces to save the trouble of doing any sum at the end.

GEOGRAPHY SKETCH—WESTMORLAND.



On June 6th, 1902, we went up Wansfell, provided with note books and pencils, and from our own observation, with the help of a compass and ordnance map, we made a sketch map of the county, marking with a dotted line what we could see.

The name Westmorland comes from the Latin Westmarialand or Westmarland, which was changed into Westmerland or land of the western meres, and finally became

Westmorland or land of the western boundaries. Westmorland and Cumberland are not mentioned in the Doomsday book. They were made in later times. The Roman occupation of Westmorland lasted 500 years. About the middle of the fifth century, 449 A.D., the Saxons invaded Britain, but Westmorland was left undisturbed. It did not form part of the Saxon Heptarchy, but was part of the Welsh kingdom of Strathclyde, which extended from the Clyde to the Dee. It was not conquered by the Saxons, and continued to be held by the remaining British inhabitants of the country. In 607, Ethelfrith, King of Northumbria, defeated the Welsh at Chester, and annexed part of the present counties of Lancashire and Westmorland, thus dividing the Welsh of Wales from those of Strathclyde. The southern part of Westmorland became part of Northumbria. In the ninth century the Danes invaded England, and the district suffered considerably from their ravages. In 901, Edward the Elder came to the throne, and was subsequently recognised as overlord by the Britons of Strathclyde and by the Scotch. After his death, Athelstan carried on a war against them, which was brought to a close by the Peace of Dacre. Later Strathclyde was held as a fief by the King of Scotland. Cumbria then began to be spoken of, but not Westmorland. The Danes burnt Carlisle, the ruins of which stood for 200 years, inhabited only, it is said, by a few Jews. After the Norman Conquest, William Rufus took possession of Carlisle. Strathclyde then became English, and was given into the hands of Earls, and called the land of Carlisle. This arrangement proved rather unsatisfactory, the barons giving a good deal of trouble, and finally, in Henry I. reign, the counties of Cumberland and Westmorland were made. Westmorland consisted of the baronies of Appleby and Kendal.

There are still remains of several castles built by William Rufus, *e.g.*, Brougham, Brough, and Appleby.

L. E. C.

MATHEMATICAL MYSTERIES.

Let your victim write down any number of three figures, not seen by you, as : 976, then tell him to reverse the figures : 679, and subtract the smaller of the two from the bigger—

976

679

—
297

Then ask him to tell you the unit, and you can tell him the whole number, as the middle figure will always be 9 and the other two make 9 together.

Another puzzle is : Let the other person write down any row of figures not seen by you, as : 174825, then say : now add up the figures, and what you get subtract from it. In this case they add up to 27, and $174825 - 27$ leaves 174798. Now say : Cross out any one of the figures and tell me those that are left, and I will tell you what you crossed out. Let us say the 7 is crossed out, and as you get told 17498 are left, you add them up quickly. To make it easier you can leave out the 9, and say to yourself, $1 + 7 + 4 + 8 = 20$, and you can tell a 7 is crossed out, as 7 is wanted to make 9 go into it. However, you might be puzzled if the 9 were crossed out instead of the 7, as it might be a 9 or a 0. In this case you say 9, and if you are told it is wrong, admit a mistake and say 0.

A great deal of fun may be got by asking a person to write down eleven thousand eleven hundred and eleven, as quickly as possible. They will begin by writing the figure 1 again and again and then try a 0 between, and it is remarkable how few think of writing 12111. I have seen even gentlemen puzzled by this.

A desire to please and interest children when doing simple multiplication sums is to ask them which is their favourite figure. Suppose they say 4, then put down 12345679, and for the multiplier take their favourite figure multiplied by 9 (in this case 36) and the answer will come in all 4's. Whatever figure they choose multiply it by 9, and if they choose 1 let them simply multiply the multiplicand by 9. Notice that the 8 is omitted in the multiplicand.